Electronic Supplementary Material (ESI) for RSC Advances.

Interzeolite conversion of micronsized FAU to nanosized CHA zeolite free of organic structure directing agent with high a CO_2 capacity

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Supporting information

Table S1: List of conditions for selected synthesis samples

Entry #	Name	FAU source	H_2O/Si	K/Si	Na/Si	Time / h	Phase	Yield[a]
1	CHA(1.9)	CBV400	40	0.76	0.25	96	CHA*	113%
2		CBV400	40	0.51	0.51	96	CHA + minor FAU	
3		CBV720	30	0.5	-	168	Amorphous	
4	CHA(2.3)	CBV720	30	1	-	168	CHA**	24%

[a]Yield calculated by (mass product)/(mass starting zeolite) *Minor impurity of LTA or GME **Minor impurity of LTL

ICP analysis

Table S2: ICP results for CHA zeolite samples

Sample	Si/Al	Na/Al	K/Al
CHA(1.9)	1.9	0.06	0.93
CHA(2.3)	2.3	0.01	0.97

SEM images

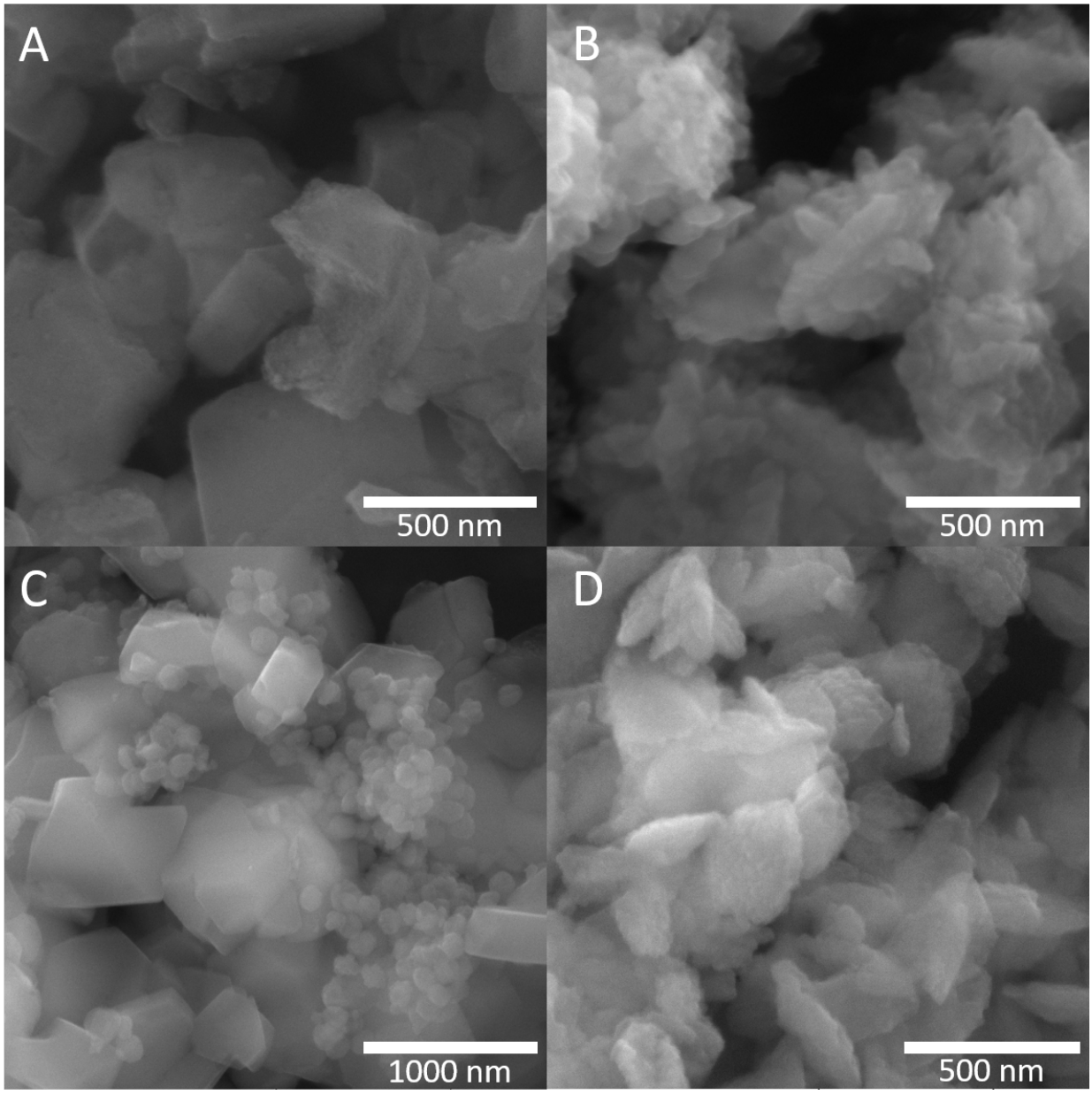

Figure S1: SEM images of (A) FAU(15), (B) CHA(2.3), (C) FAU(2.6), and (D) CHA(1.9) zeolite samples

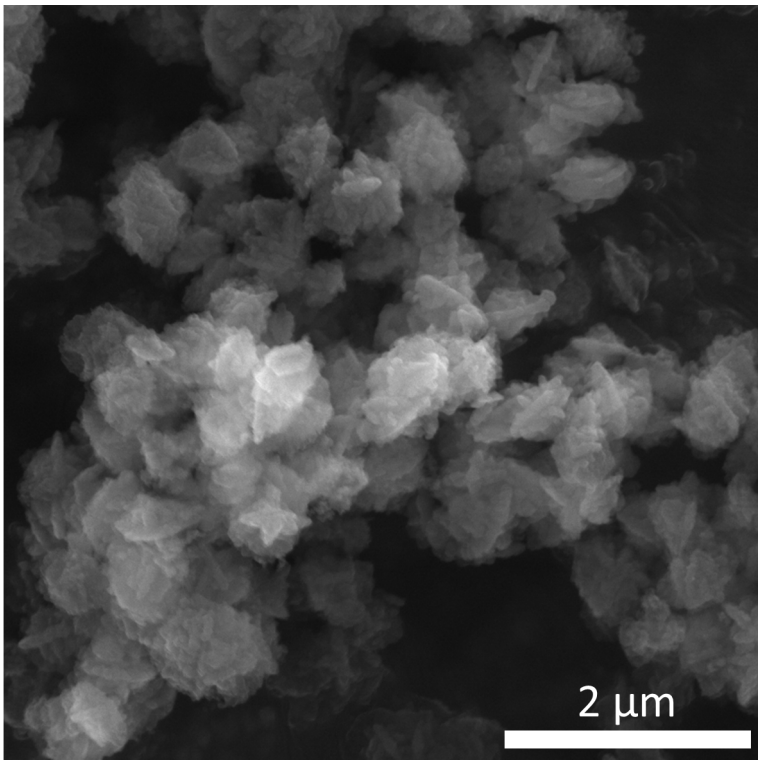

Figure S2: SEM image of CHA(2.3) zeolite

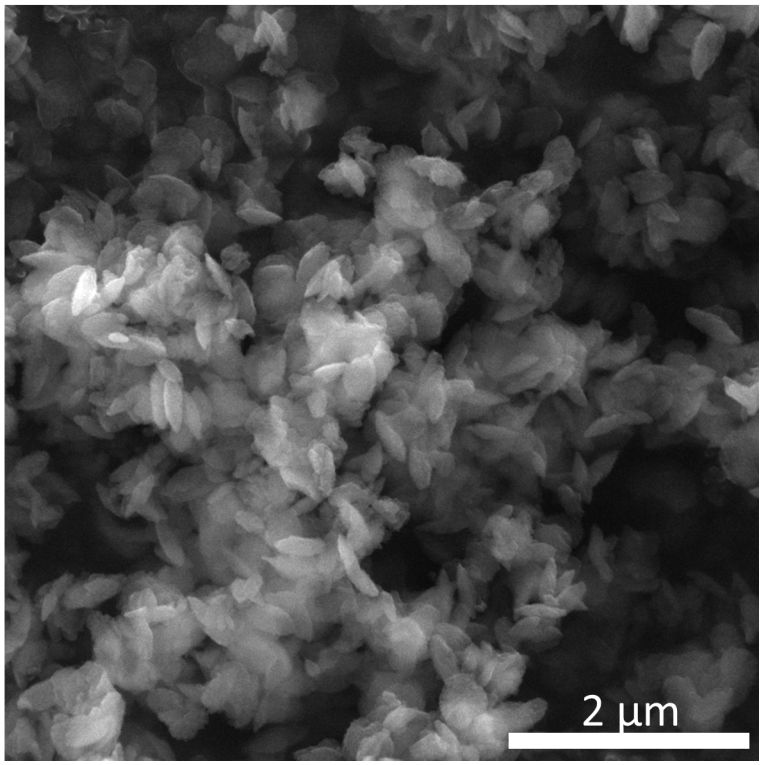

Figure S3: SEM image of CHA(1.9) zeolite

TEM images

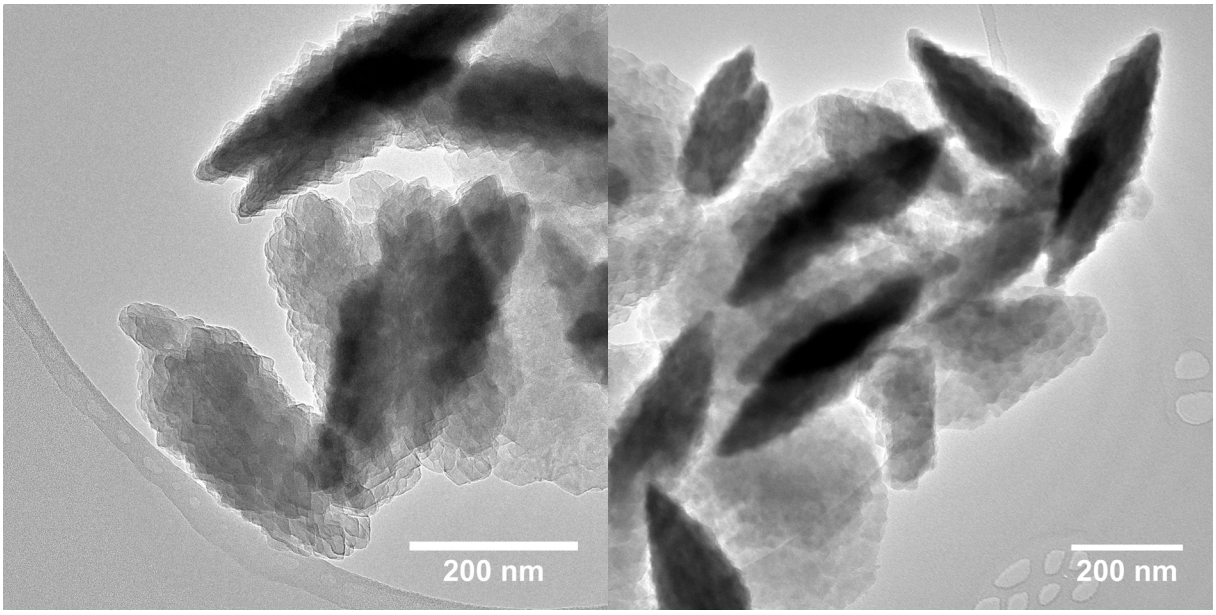

Figure S4: TEM image of CHA(1.9)

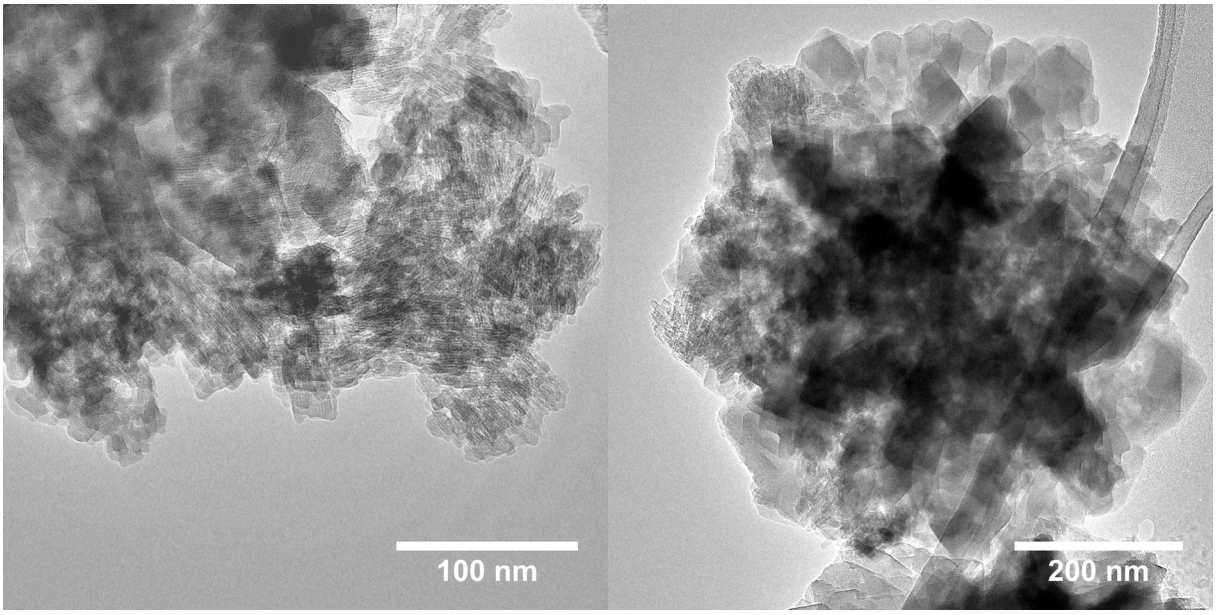

Figure S5: TEM image of CHA(2.3)

Nitrogen physisorption of FAU(2.6), FAU(15), CHA(1.9), and CHA(2.3) zeolite samples

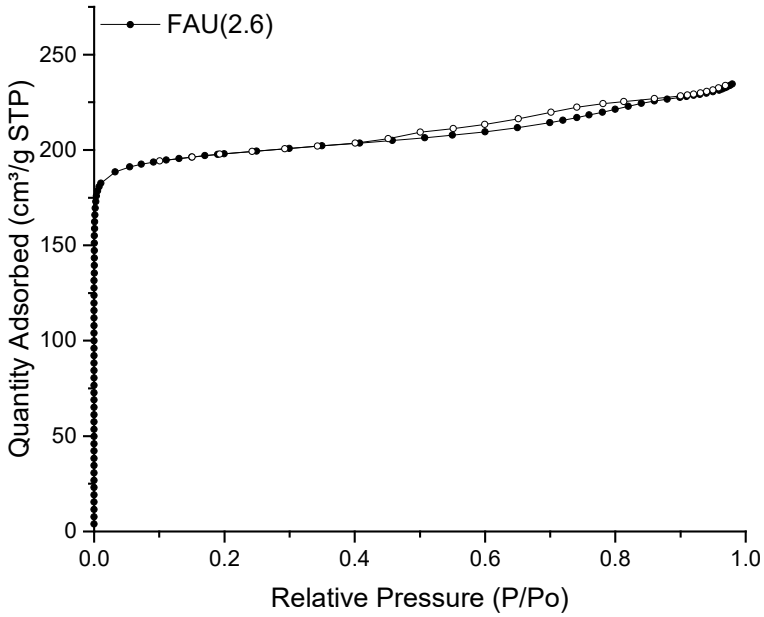

Figure S6: Nitrogen physisorption isotherm of FAU(2.6) zeolite at 77K

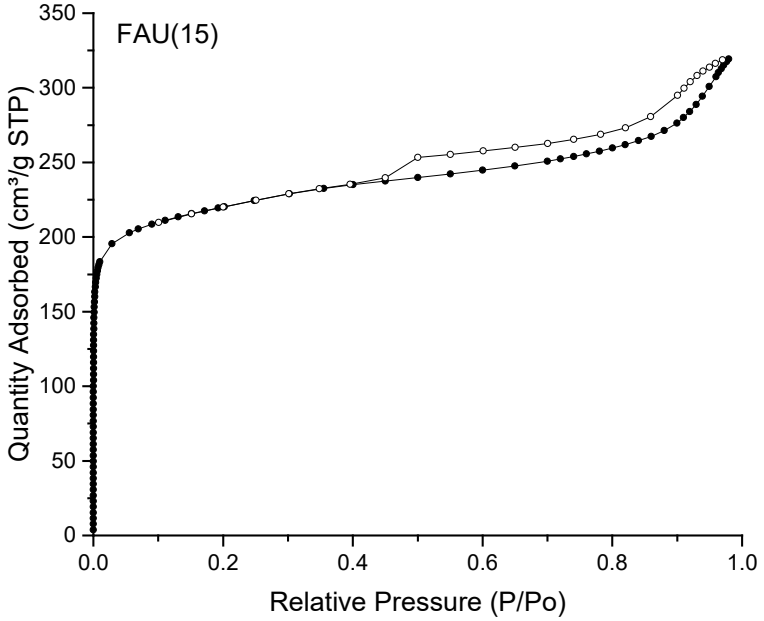

Figure S7: Nitrogen physisorption isotherm of FAU(15) zeolite at 77K

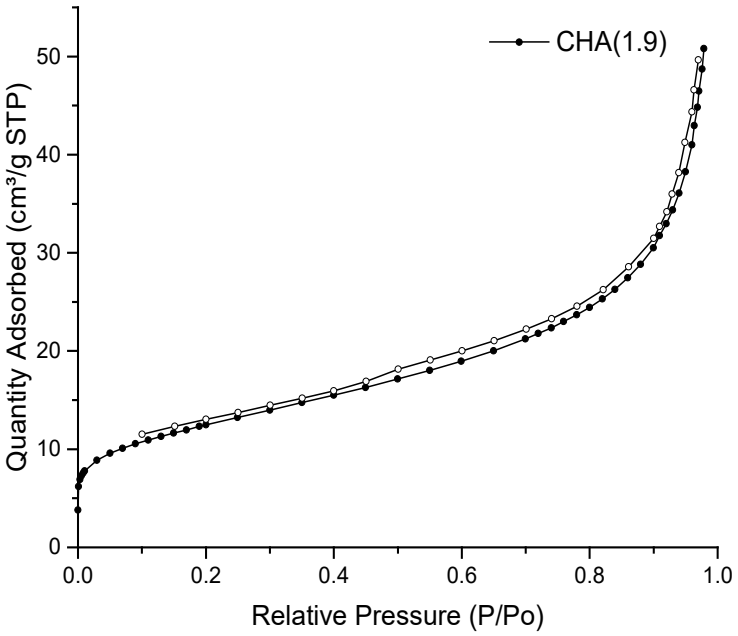

Figure 8: Nitrogen physisorption of CHA(1.9) at 77 K

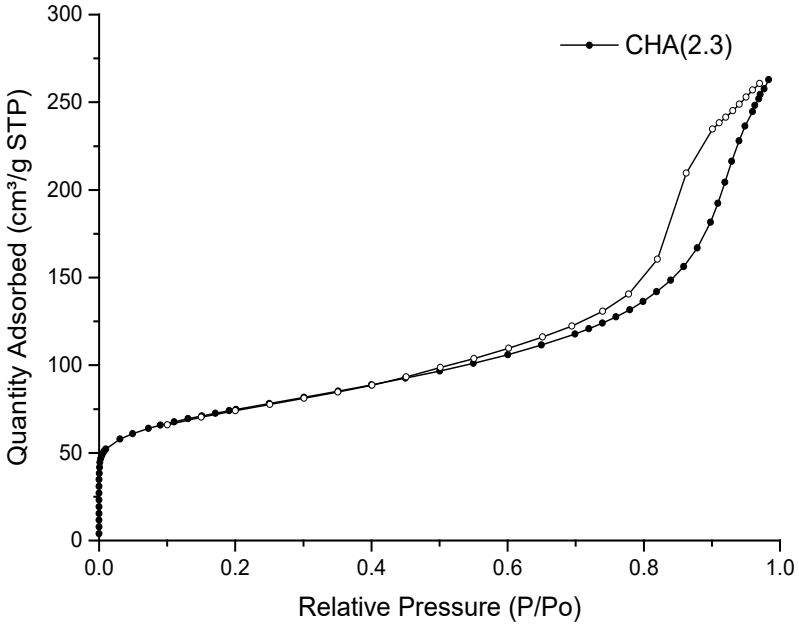

Figure S9: Nitrogen physisorption of CHA(2.3) at 77 K

Table S3. Calculated porosity of FAU and CHA samples by N_2 physisorption at 77 K

Sample	V_{total} (cm^3/g)[a]	$V_{micropore}$ (cm^3/g)[b]	S_{BET} (m^2/g)[c]	S_{ext} (m^2/g)[b,c]
FAU(2.6)	0.49	0.280	695	140
FAU(15)	0.36	0.280	606	62
CHA(1.9)	0.07	0.004	43	33
CHA(2.3)	0.39	0.045	251	162

[a] Single point adsorption [b] Determined by the t-plot method [c] Determined by the Brunauer-Emmett-Teller method

CO_2 FTIR spectroscopic study

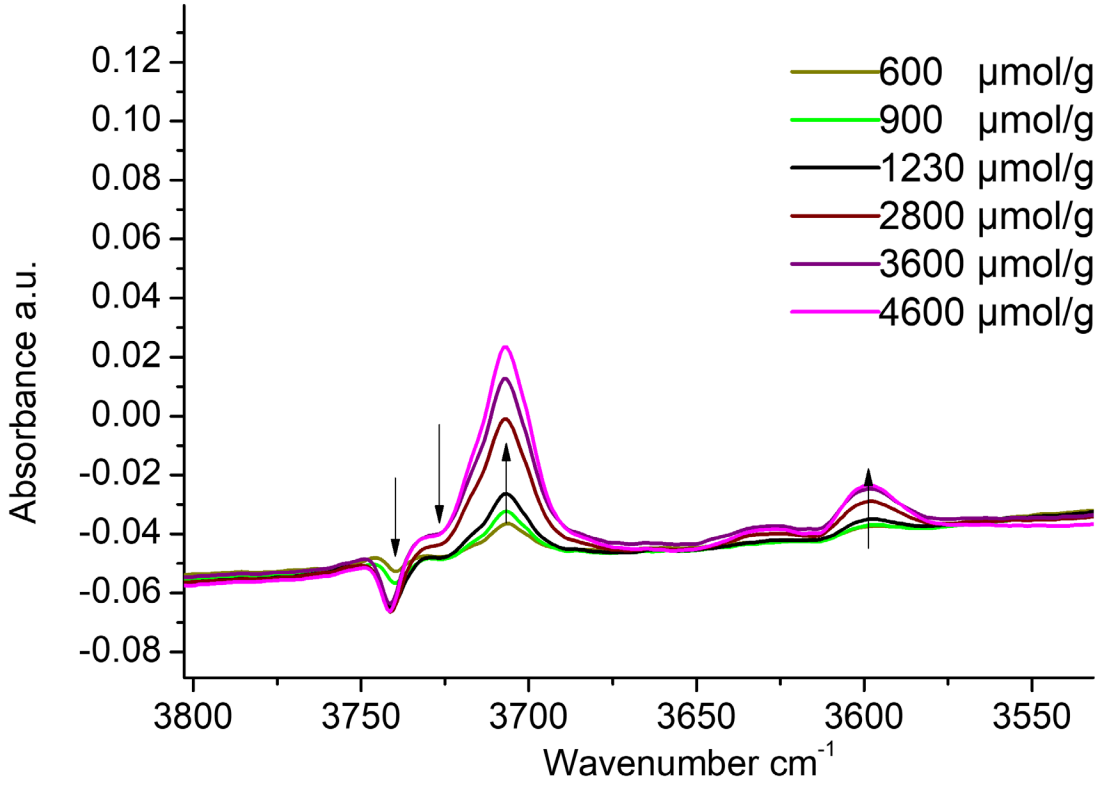

Figure S10. IR spectra of CO_2 adsorbed on CHA(2.3) in the region of 3820-3510 cm^{-1}

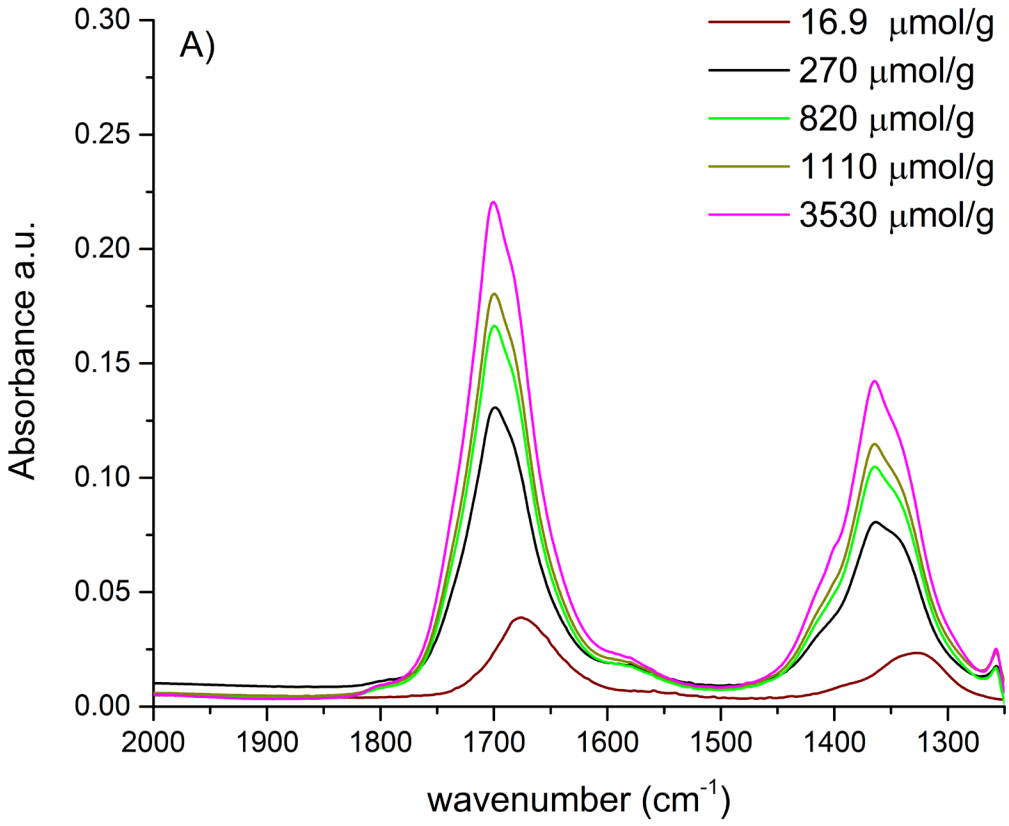

Figure S11. IR spectra of pulsed CO_2 adsorbed on CHA(1.9) in the region of 2000-1250 cm^{-1}

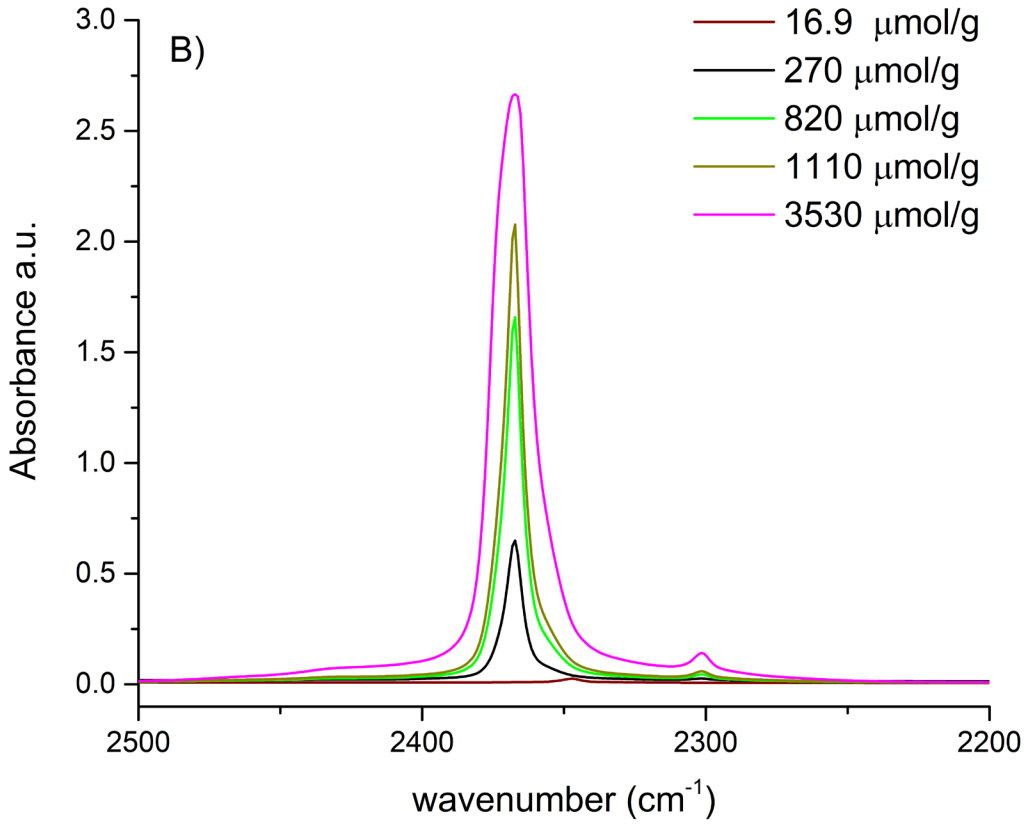

Figure S12. IR spectra of pulsed CO_2 adsorbed on CHA(1.9) in the region of 2500-2200 cm^{-1}

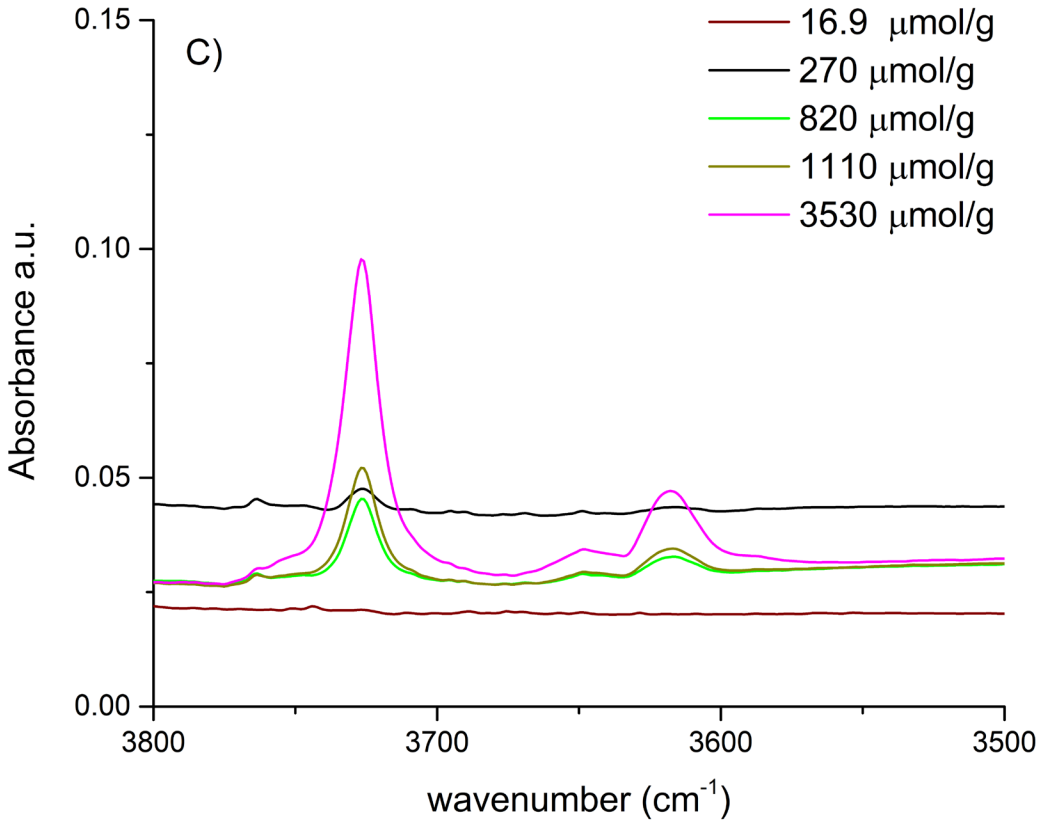

Figure S13. IR spectra of pulsed CO_2 adsorbed on CHA(1.9) in the region of 3800-3500 cm^{-1}

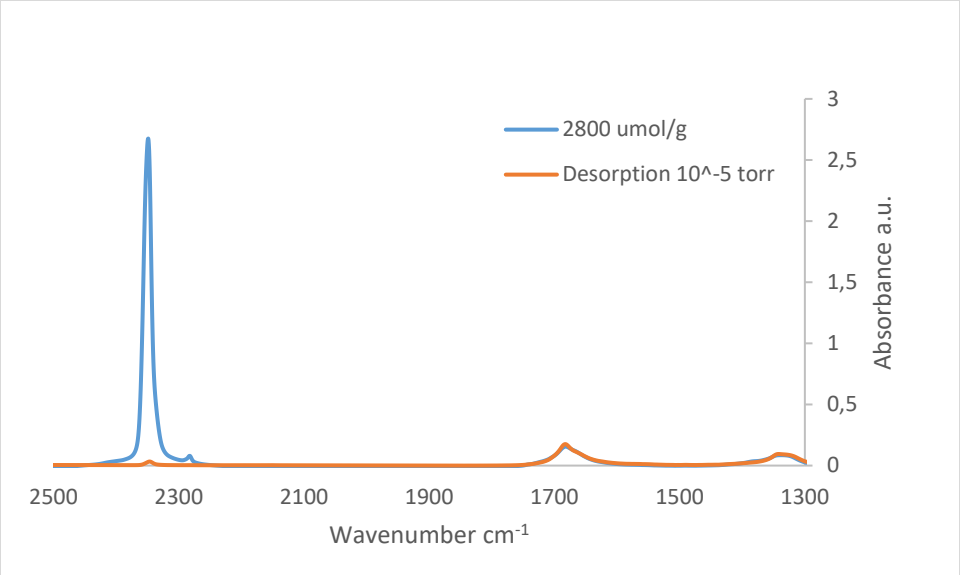

Figure S14: IR spectra of pulsed CO_2 adsorbed on CHA(2.3) and after desorption at 10^{-5} torr

CO FTIR spectroscopic study

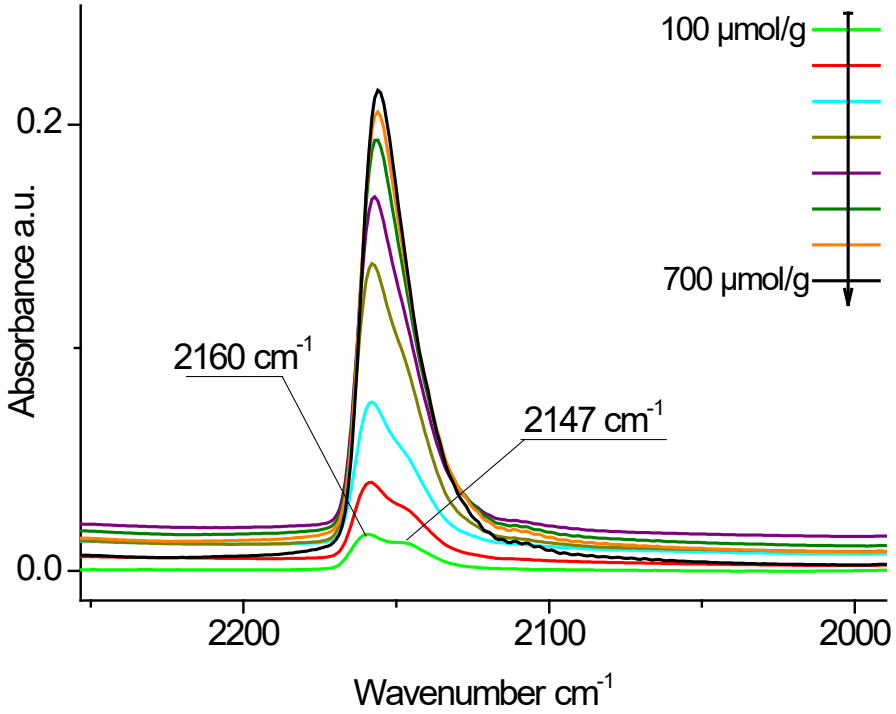

Figure S15. IR spectra of CO adsorbed on CHA(1.9) at 77 K.